

TOSHIBA

6F9E0086

INSTRUCTION MANUAL
TEMPERATURE CONTROL RELAY
MODEL RTM20

Read and understand this instruction manual before attempting any
installation, wiring or operation of this relay.

TOSHIBA CORPORATION

CODE: RY

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1. OUTLINE

The motor temperature monitoring unit can be used in various industrial fields as a protection relay for motor windings, bearings and internal atmosphere by monitoring and measuring their temperature through temperature measuring resistors.

The unit uses a microcomputer and can automatically stop temperature drift as it varies from preset reference points.

It can maintain accuracy over a wide temperature range.

Moreover, it is designed for flexibility and is reliable in a variety of environments.

Read this manual carefully and you will be able to use the relay correctly and effectively.

2. SPECIFICATIONS

Items	Specifications.	Remarks
1. Display temperature	-20 to +200°C	
2. Sensor inputs	8 RTDs	3-wire
3. Sensor type (RTD)	Selection -Resistance Platinum (Pt) 100Ω Nickel (Ni) 100Ω Nickel (Ni) 120Ω Copper (Cu) 10Ω	Resistance Tables are from ANSI.
4. Temperature accuracy	Pt 100Ω } ±0.5° C Ni 100Ω } Ni 120Ω } cu 10Ω ±1° C	
5. Trip/Alarm set point	From 40° C to 195° C in graduations of 5° c.	

Items	Specifications	Remarks																																				
. Trip/alarm set point mode selector	<p>Sensor inputs are divided into two or three sections, as follows.</p> <table><tr><td>Channel No.</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>Mode</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td colspan="6">A</td><td colspan="2">B</td></tr><tr><td>2</td><td colspan="2">A</td><td colspan="2">B</td><td colspan="4">C</td></tr></table> <p>*</p> <p>The letters A, B, and C are symbols used on the front nameplate of the relay, and represent RTD mounting areas. For example, A channels might be used on stator windings, B channels might be used on bearings and so on.</p>	Channel No.	1	2	3	4	5	6	7	8	Mode									1	A						B		2	A		B		C				
Channel No.	1	2	3	4	5	6	7	8																														
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7. outputs	<p>a. Alarm output</p> <table><tr><td></td><td colspan="3">output</td></tr><tr><td></td><td>Conditions</td><td>Relay out-put</td><td>Indi-cator</td></tr><tr><td>1</td><td>1. Temperature on A channels rises above .9 x trip set value 2. (A) An A channel RTD contact breaks</td><td>Alarm (A) (1 circuit is closed)</td><td>a</td></tr><tr><td>2</td><td>1. Temperature on B channels rises above .9 x trip set value 2. (B) A B channel RTD contact breaks</td><td>Alarm (B) (1a)</td><td>a</td></tr></table>		output				Conditions	Relay out-put	Indi-cator	1	1. Temperature on A channels rises above .9 x trip set value 2. (A) An A channel RTD contact breaks	Alarm (A) (1 circuit is closed)	a	2	1. Temperature on B channels rises above .9 x trip set value 2. (B) A B channel RTD contact breaks	Alarm (B) (1a)	a																					
	output																																					
	Conditions	Relay out-put	Indi-cator																																			
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Items		specifications			Remarks	
7.			output			
			Conditions	Relay out-put		Indi-cator
			1. Temperature on C channels rises above .9 x trip set value	Alarm (C)		-
			2. (C) A C channel RTD contact breaks	(1a)		
		b. Trip output				
			output			
			Conditions	Relay out-put		Trip indi-cator
			1 (A) Area A tempera- ture rises above A channels' trip set value	Trip (A) (1a)		Red on
			2 (b) Area B tempera- ture rises above B channels' trip set value	Trip (B) (1a)		Red on
			3 (C) Area C tempera- ture rises above C channels' trip set value	Trip (C) (1a)		Red on

Items	Specifications	Remarks															
	<p>c. Contact capacity</p> <p>(cosϕ = 0.4, L/R = 7 ms)</p> <table><tr><th>Resistive load</th><th>Inductive load</th></tr><tr><td>250 Vac 5 A</td><td>250 Vac 2 A</td></tr><tr><td>30 Vdc 5 A</td><td>30 Vdc 2 A</td></tr></table> <p>* Inductive Load</p> <table><tr><th></th><th>Continuous</th><th>Interruptive</th></tr><tr><td>ac</td><td>5 A</td><td>5 0 0 VA*1</td></tr><tr><td>dc</td><td>5 A</td><td>5 0 W*2</td></tr></table>	Resistive load	Inductive load	250 Vac 5 A	250 Vac 2 A	30 Vdc 5 A	30 Vdc 2 A		Continuous	Interruptive	ac	5 A	5 0 0 VA*1	dc	5 A	5 0 W*2	
Resistive load	Inductive load																
250 Vac 5 A	250 Vac 2 A																
30 Vdc 5 A	30 Vdc 2 A																
	Continuous	Interruptive															
ac	5 A	5 0 0 VA*1															
dc	5 A	5 0 W*2															
8. Display	<p>. Channel 1 digit</p> <p>Measured value 3 digits</p>																
9. Sampling and response time	<p>1 Sampling time 4 S¹/8 CH</p> <p>2 Output response time . a S (max.)</p>																
10. Reset	<p>Selectable from auto or manual</p> <p>1 Auto (A) Automatic reset</p> <p>2 Manu. (M) Resets during</p> <p>MANUAL-RESET</p> <p>switch is being</p> <p>depressed.</p>	<p>Hysteresis</p> <p>5° c</p>															
11. Power supply	<p>100 to 120 Vac (+10%, -15%)</p> <p>50/60Hz</p> <p>or</p> <p>100 to 125 Vdc (+10%, -15%)</p>																
12. Insulation resistance	<p>100 MO or more</p>	<p>With a 500 V megger</p>															

* Note: *1 Maximum application voltage is 380 Vac and power factor ($\cos\phi$) is 0.4.

*2. Contact capacity at 30 Vdc and time constant (L/R) is 7 ms. Capacity must be derated at higher voltage.

	Items	Specifications	Remarks
L3	Dielectric strength	2000 v ac, one minute	Between output and power supply terminals in common and earth Between output terminals and power supply terminals
14	Vibration-proofing	Endurance 2a (total amplitude) = 3 mm 16.7 Hz, 3 directions, 2 hours each	
15.	Power consumption	6 VA	
16.	Ambient temperature	-10 to +60° C	
	Humidity	10 to 95% RH (no condensation) (-20 to +60° C: In storage and transportation)	
17.	Mounting	Flash mounting	
18.	Outline dimensions (in millimeters)	120 W x 235 H x 190 D Case Black semi-luster coating	Refer to Outline drawing.
19.	Weight	2.6 kg	

3. DESCRIPTION of FRONT PANEL

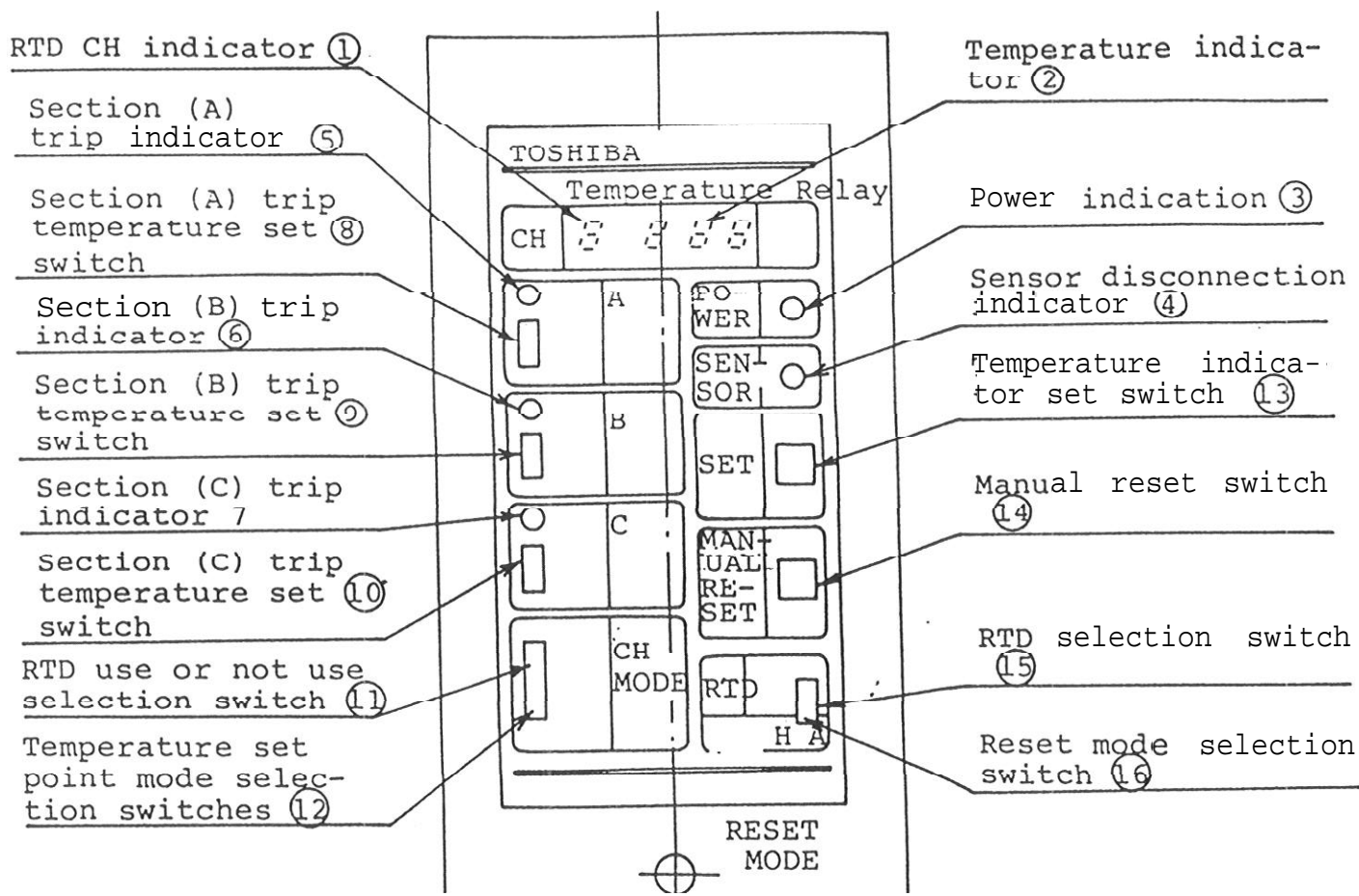






Figure.1 Front Panel Layout

- ① RTD channel indicator
Indicates CR. No.'s 1 to 8 incrementally, on operation of temperature indicator set switch.













- ② Temperature indicator
Indicates the temperature of the channel selected by RTD channel indicator (①)
. Measuring range: -20°C to $+200^{\circ}\text{C}$ (1°C step)
. Display: Depends on how RTD is used, for example:

	Indicator	Meaning
Channel →	   	. RTD not used

When the following indicators flashes at 0.8 second intervals, some abnormality has happened:

	Indicator	Meaning
	    Temperature rises to or above trip set point. Temperature reading flashes at 0.8 second intervals.

(Indicated temperature is between -20°C and 200°C)

			 RTD disconnection
				. 200°C or higher
			 -20°C or lower

- ③ Power indicator (yellow)
Turns on when power supply is kept on.
- ④ Sensor indicator (Red)
Turns on when there is a break in an RTD wire.
- ⑤, ⑥ and ⑦ Trip indicator (Red)
Turns on when indicating that the temperature monitored by the RTD's in either the A, B, or C channels has risen above the acceptable limit set on the relay.
- ⑧ Section.(A) trip temperature set switch

4. WIRING

4.1 RTD Input Wiring

Attach cables as follows:

- . Three shielded conductor cables for sensor inputs
- . Twisted cable for alarm and trip contacts

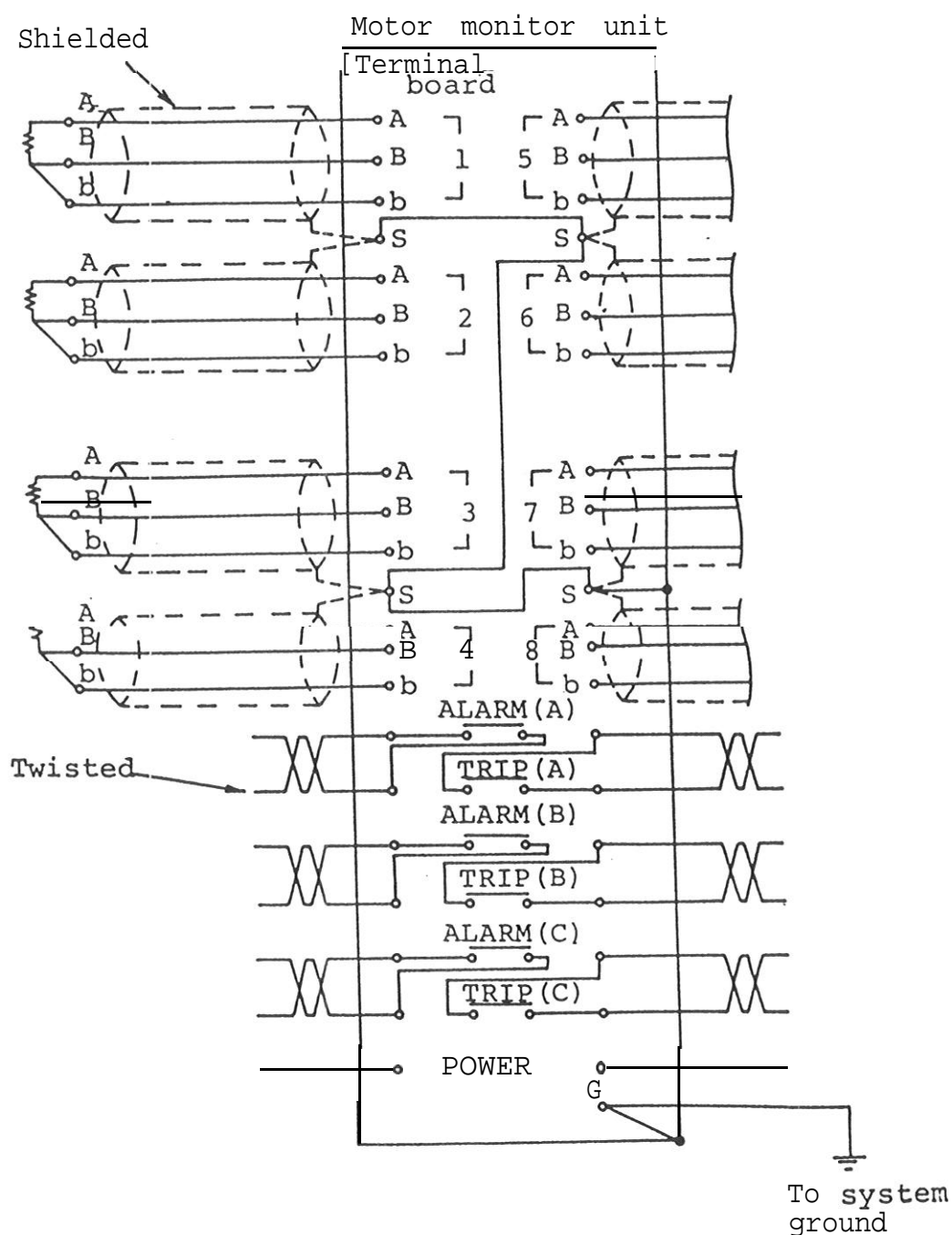


FIGURE 2 External Connection Diagram

4.2 Alarm Output Wiring

Connect the alarm signal leads (alarm, trip) to the terminals on the monitor unit's rear surface terminal board, according to the nameplate.

When an inductive load such as a relay is connected on the load side, apply spark suppression circuits on both ends of the inductive load to ensure the long life of the unit contact to suppress noise.

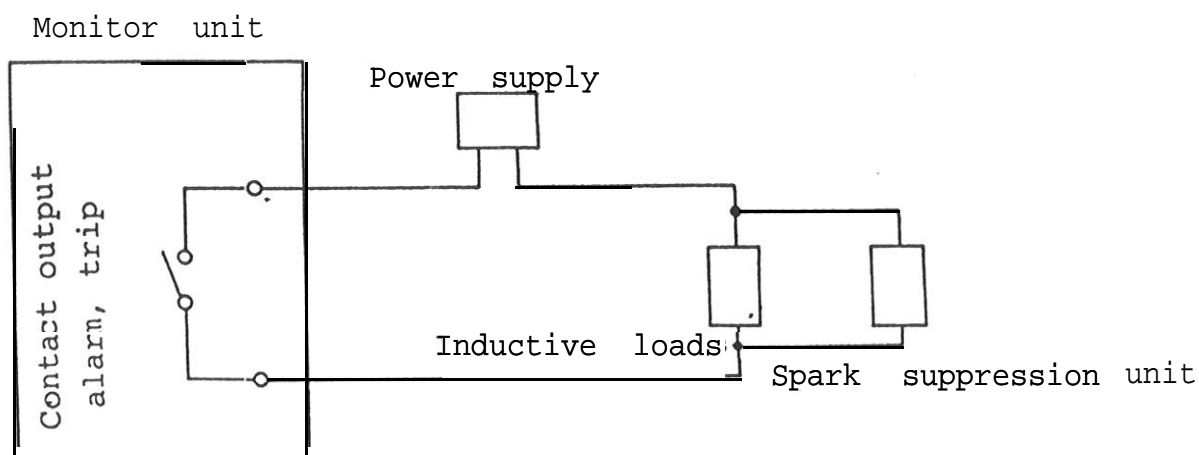
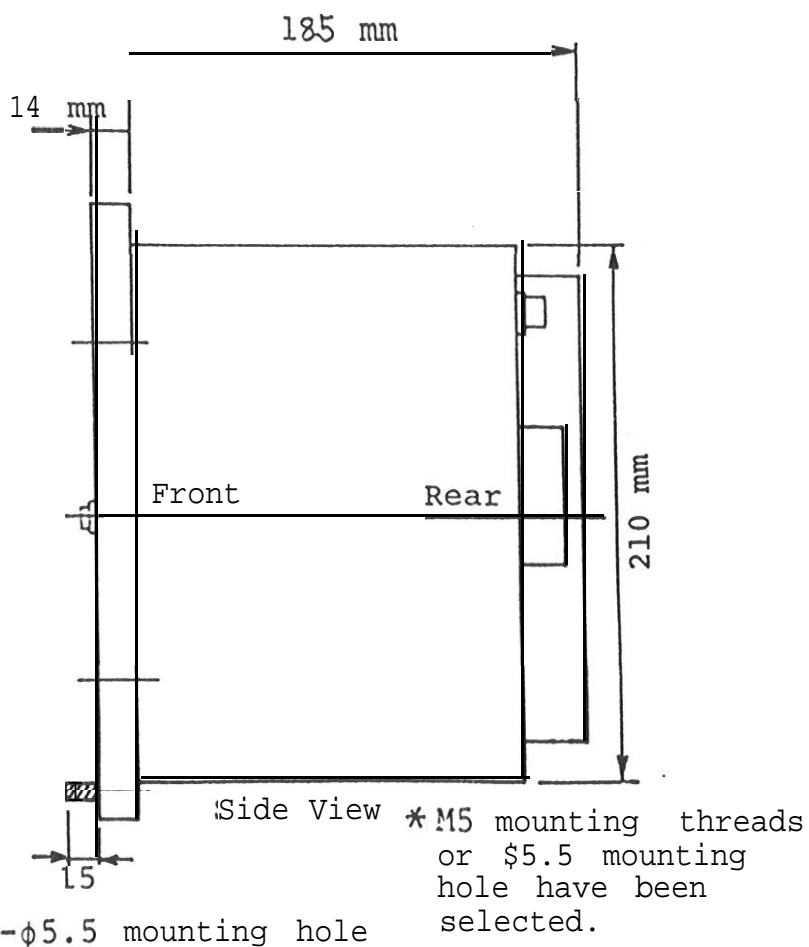
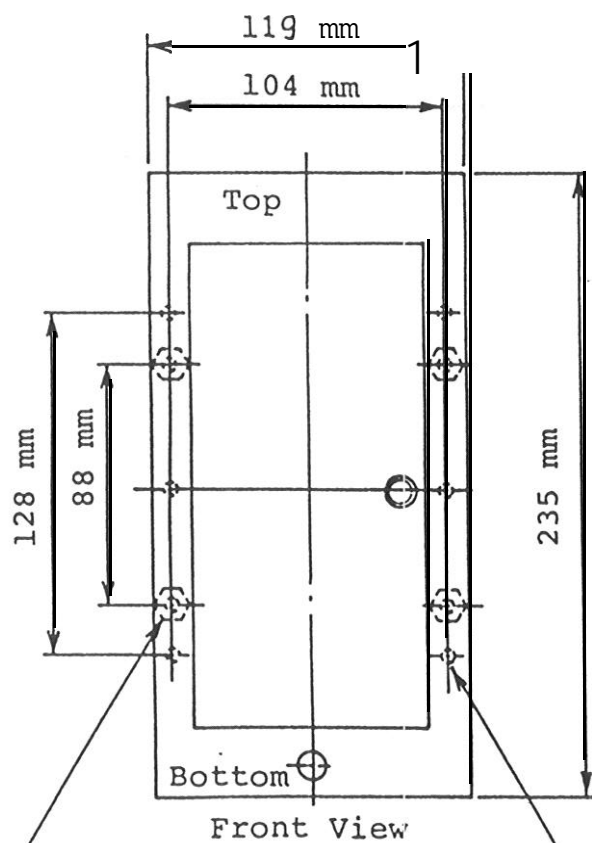
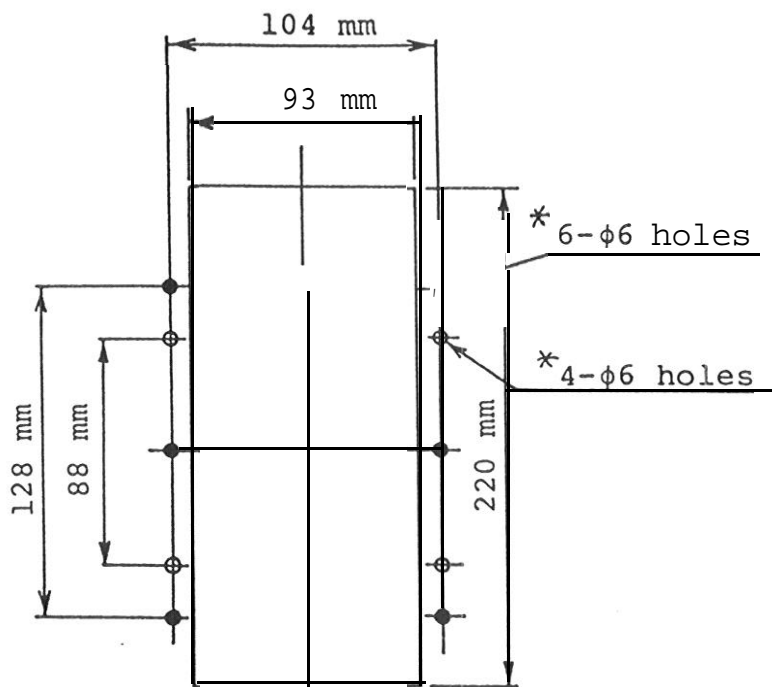
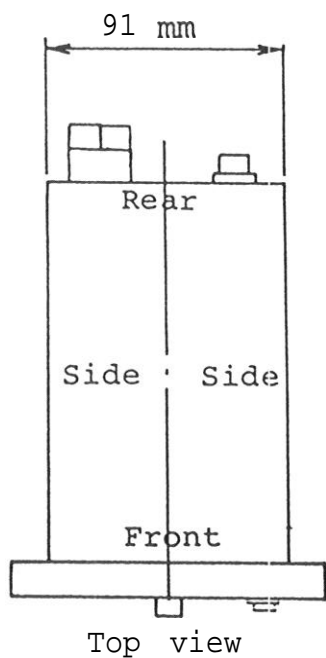


FIGURE 3 Output Circuit Configuration

4.3 Wiring for Power Supply

The monitor unit can use either 100 Vac to 120 Vac or 100 Vdc to 125 Vdc. Connect the leads to the POWER terminals on the rear surface of the unit.

5. OUTLINE DIMENSIONS

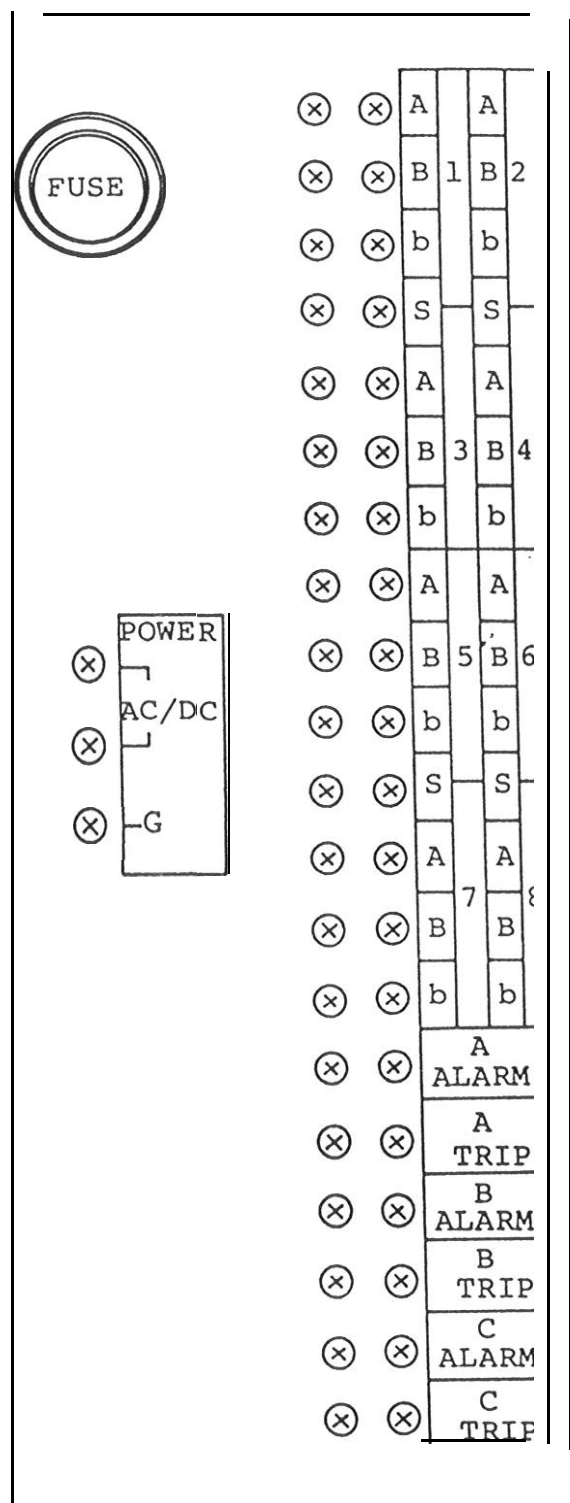


4-M5 mounting
screw threads

6- $\phi 5.5$ mounting hole

FIGURE 4 Outline Drawings

Rear surface



* Applicable fuse
... AC250V, 2A

FIGURE 5 Terminal Layout